LENNOX® CORE LITE UNIT CONTROLLER BACNET SETUP GUIDE

508727-01
04/2025

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WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.
Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency.

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1. BACnet Quick Start

This section demonstrates a simple integration with the Lennox® CORE LITE Unit Controller using BACnet MS/TP. The contents of this document indicates all available points and functionaries.

NOTE: *The CORE LITE Unit Controller may be referred to as unit controller throughout this instruction from the point on.*

1.1. BACnet Network Connections Types

- BACnet MS/TP to CORE LITE Unit Controller connection requires twisted pair with shield, 22AWG min. Belden type 88761 or 8761 cable. Lennox 27M19, 94L63 or 68M25

1.2. General

This document is provided to assist in the integration of the CORE LITE Unit Controller to the building automation system.

- The BACnet interface requires a separate add-on plug-in BACnet MS/TP interface module that provides the wiring connection points to the MS/TP network.
- The unit control BACnet Interface allows communication between the CORE LITE Unit Controller and a BACnet MS/TP network. The connections for BACnet MS/TP are available on a separate add-on BACnet plug-in module.

NOTE: *See **CORE LITE Unit Controller and Expansion Port Locations** in the Lennox® CORE LITE Control System (Unit Controller) Application Guide for port locations on the CORE LITE Unit Controller.*

- The unit BACnet® interface has been developed to communicate with building automation systems that support the BACnet Application Specific Controller (B-ASC) device profile.

1.3. Lennox® CORE LITE Service App Features

- The mobile application is compatible with the CORE LITE Unit Controller.
- The mobile application can discover the CORE LITE Unit Controller if within 50 feet of the mobile device being used.
- The mobile application will list the units by signal strength.
- The unit friendly name is displayed.
- Select the desired unit from the discovery list. The four digit code desired on the unit will show the code listed in the discovery list.
- Once the unit has been selected, connection should be established to your device within 10 seconds.
- Information displayed once pairing is completed will be RTU name, model number, serial number and firmware version.

1.4. Enabling the CORE LITE Unit Controller BACnet Interface

NOTE: *Before configuring the BACnet MS/TP via the CORE LITE Service App., the Configuration ID 1 setting must be adjusted.*

Access the Configuration ID 1 setting and change the network interface character to "B". This indicates the optional separate add-on BACnet plug-in module has been installed. The BACnet MS/TP options in the Network Integration Wizard will become visible to users.

To enable the BACnet interface using the mobile service app:

1. Connect to the CORE LITE controller and navigate to the **RTU Menu**.
2. Select **Network Integration**.
3. Choose **Network Setup Wizard** (beneath Network Setup) to proceed. All CORE LITE controllers are BACnet MSTP ready and only require the proper BACnet network setup for operation.

NOTE: *Refer to **CORE LITE Service App Menu Selection Overview, Install Menu Structure,** and **BACnet MS/TP Menu Structure** in the Lennox® CORE LITE Control System (Unit Controller) Application Guide.*

1.4.1. Common Integration Guidelines

For firmware version 9.03 and later, *Change of Value* (CoV) functionality is available via an add-on BACnet plug-in module. Any firmware prior to version 9.03 will not support CoV. See "Object Definitions" on page 9 for details on objects that support CoV.

1.4.2. Examples of Basic Optional Objects

Lennox recommends the following objects for writing generic applications:

- AO102 (Outdoor Air Min Pos Control)
- AO104 (Occupancy Scheduler Control)
- AO108 (Space Dehumidification Setpoint)
- AV130 - AV133 (Occ/Unocc Heat/Cool Setpoints)
- AO111 (IAQ 1 Network Input)
- AO112 (Humidity Network Input)
- AO113 (Space Temperature Input)

NOTE: *AO objects do not support CoV.*

How to use these objects:

- Write to the Network Inputs (AO111-113) every 2 minutes
- Write to the Setpoints (AO108 and AO109) every 7 minutes
- Write to AO102 to enable a greater minimum position. This is not an override and will not necessarily close a damper opening.

1.4.3. Recommended Objects for Reading Unit Status

- AI232 (Unit Status)
- AI239 (Space Temperature)
- AI240 (Discharge Air Temperature)
- AI244 (Outside Air Damper)
- AI250 (Supply Fan Status)
- AI252 (Space Temperature Setpoint (Effective))
- AI253 (Current Error Code)
- AI274 (Space CO2 Sensor (Effective)
- AI276 (Space Humidity (Effective))
- AI278 (Dehumidification Setpoint (Effective)
- AI281 (Return Air Temperature)
- MSV310 (Current Operating Mode)

How to use these objects:

These objects are read-only, use them for monitoring, unit graphics, and checking unit statuses.

1.5. Integrating the CORE LITE Unit Controller into a BAS System (Multi-Zone VAV)

This section discusses how to integrate the CORE LITE Unit Controller into a BAS VAV (Multi-zone) configuration. It assumes you have integrated zone boxes and individual zone sensors appropriately.

1.5.1. Common Integration Guidelines

- Device Max_Master = 127
- This device supports Change of Value (CoV)

1.5.2. Examples of Basic Optional Objects

Lennox recommends the following objects for writing generic applications:

- AO102 (Outdoor Air Min Pos Control)
- AO104 (Occupancy Scheduler Control)
- AO113 (Space Temperature Input)
- AV130 (Heating Occupied Setpoint)
- AV131 (Cooling Occupied Setpoint)
- AV132 (Heating Unoccupied Setpoint)
- AV133 (Cooling Unoccupied Setpoint)

How to use these objects:

The setpoints will provide additional operating setpoints for MSAV logic and allow staging of compressors, heater, and fan, to meet the discharge temp and static setpoints.

1.5.3. Recommended Objects for Reading Unit Status

- AI232 (Unit Status)
- AI244 (Outside Air Damper)
- AI250 (Supply Fan Status)
- AI253 (Current Error Code)
- AI281 (Return Air Temperature)
- MSV310 (Current Operating Mode)

How to use these objects:

These objects are read-only, use them for monitoring, unit graphics, and checking unit statuses.

2. Network Setup for Common BACnet MS/TP

2.1. CORE LITE Unit Controller BACnet MS/TP Interface Specifications and Default Settings

Table 1. CORE LITE Unit Controller BACnet Interface Specifications and Default Settings

Environment	
Operating temperature range	-40°F to 155°F
Storage temperature range	-40°F to 185°F
RH	10-95% RH non-condensing
Field Connections	
Transceiver	RS-485
Connector	Three-position terminal block (+ G –)
Baud Rate	Selectable 9.6, 19.2, 38.4, 76.8K
Cable Type	Twisted pair w/shield, 22AWG min. Belden type 88761 or 8761. Lennox 27M19, 94L63 or 68M25
Max. Cable Length	4000 ft. repeater is required for longer lengths.
Bus Termination	120 ohm resistor on last interface in chain.
Default Values	
Device Object_Identifier	MAC address
Device Object_Name	“Lennox_M4_” + MAC address of MS/TP
RTU Location	“RTU Location"
Device Description	“Lennox RTU HVAC Controller"
Baud Rate	38.4K
Recommended Update Rate	At least once every 12 minutes
Communication Time-out	15 minutes

2.2. Configuring BACnet MS/TP

NOTE: *Before configuring the BACnet MS/TP via the CORE LITE Service App., the Configuration ID 1 setting must be adjusted.*

Access the Configuration ID 1 setting and change the network interface character to “B”. This indicates the optional separate add-on BACnet plug-in module has been installed. The BACnet MS/TP options in the Network Integration Wizard will become visible to users.

To configure BACnet MS/TP via the CORE LITE Service App:

1. Go to **RTU MENU > NETWORK INTEGRATION > NETWORK SETUP WIZARD**:
2. Choose **BACnet MS/TP**.
3. Set the **BACnet MAC Address** (the address should be unique for each CORE LITE Unit Controller on the network).
4. Set the **Device Instance** per the Facility Controls Contractor. The Device Instance must be different for every RTU. It is recommended to set each device instance to match the MAC address. The default setting is 2 or the S-Bus address.
5. Set the **BAUD Rate** to your applicable network rate. The Lennox default BAUD is 38.4 kbps.’

NOTE: *Refer to **BACnet MS/TP Menu Structure** in the Lennox® CORE LITE Control System (Unit Controller) Application Guide for further guidance.*

2.3. Additional Configuration Steps

For Single Applications:

1. Select **Next** and select **Room Sensor** as the control mode.
2. Select **CO2 Sensor Source** as Network; select **Next**.
3. Select **Relative Humidity Source** as Network; select **Next**.
4. Select **Temperature Sensor Source** as Network; select **Next**.
5. Choose the **Occupied Blower Mode** as **Auto-Cycle**; select **Next**. Choose **On-Continuous** as necessary
6. Select the **Backup Mode** as **Return Air Backup**; select **Next**.
7. Set the **Occupied** and **Unoccupied Backup Setpoints** as necessary; select **Next.**

2.4. BACnet MS/TP Cabling

The CORE LITE Unit Controller BACnet® interface is compatible with MS/TP EIA-485 daisy-chain networks communicating at 9.6, 19.2, 38.4, and 76.8 kbps.

Connect the BACnet® MS/TP network cable to the CORE LITE Unit Controller BACnet® interface.

It is compatible with twisted pair, shielded 22 AWG minimum cable such as Belden 8761, 88761 and Lennox catalog numbers 27M19, 94L63 or 68M25.

A maximum of 32 CORE LITE Unit Controller BACnet® interfaces can be included per network segment. Up to 127 units can be connected per network segment by using repeater for every 32 devices.

The network cable should be routed using best practices to avoid induced noise. Do not route alongside high voltage wiring or in proximity to high-voltage or high-frequency devices, such as ignition controls and variable frequency drives. The BACnet MS/TP recommended maximum total bus length (without repeater) of 4000 ft. (1219m) applies to this device.

The guidelines provided were established with setting the baud rate no higher than 9.6K. When using higher baud rates we recommend that no more than 20 Lennox BACnet units and 30 devices per router. Since CORE LITE Unit Controller BACnet interface provides access to many objects, Lennox does not recommend use of repeaters in any BACnet network because of the amplified noise they tend to propagate on the network.

2.5. Connections for BACnet MS/TP

1. Connect the 6 pin P1 connector to the BACnet plug-in module on the CORE LITE Controller.
2. Do not adjust the the BACnet plug unless the interface is at the end of a daisy-chained configuration. Check with the Controls Contractor to determine the end of line requirements.

NOTE: *Lennox suggests end of line termination resistors of 120 ohms at the beginning and end of the BACnet MS/TP network.*

Upon powering up the CORE LITE Unit Controller, the BACnet interface must be configured. To configure the CORE LITE Unit Controller BACnet MS/TP Interface:

1. Install the CORE LITE Service App on your mobile device.
2. Pair to the CORE LITE Unit Controller.
3. See the CORE LITE Unit Controller Setup Guide for instructions on how to pair your mobile device to the CORE LITE Unit Controller.

2.6. BACnet MS/TP Network Bus Termination

When the CORE LITE Unit Controller BACnet® Interface is at the end of a daisy chain, connect a 120 ohm resistor across the + and - terminals. Every BACnet® MS/TP chain should have a termination at each end of the chain (exactly two terminations).

⚠ IMPORTANT

A qualified systems integrator with adequate training and experience is required to integrate and commission the CORE LITE Unit Controller BACnet Interface into a third party BACnet building automation system. A BACnet configuration software tool is required to commission the BACnet network.

General BACnet MS/TP Guidelines

1. Set all BACnet® devices on an MS/TP network to consecutive MAC addresses, starting at 1, so that there are no gaps between MAC address values.
2. Set Max_Master device property on all devices to match the largest MAC address on the network. Note, this could be larger than existing network to allow for adding devices to the network without the need to adjust the Max_Master property in the future. (Contact Lennox Technical Support for more detailed information).
3. Use ReadPropertyMultiple service instead of Read Property service when reading multiple analog inputs or values.
4. Do not exceed the maximum recommended length (1200 M / 4000 ft.) for any MS/TP segment.
5. Terminate all MS/TP network segment ends per control provider instructions

These guidelines were established with setting the baud rate no higher than 9.6K. When using higher baud rates we recommend that no more than 20 Lennox BACnet units and 30 devices per router. Since the CORE LITE Unit Controller BACnet units provides access to many objects, Lennox does not recommend use of repeaters in any BACnet network because of the amplified noise they tend to propagate on the network.

3. Control and Backup Sensor Modes

3.1. Control Mode Options

There are two Primary Control Modes available on the CORE LITE Unit Controller. The primary control mode can be set using the Network Setup Wizard on the CORE LITE Service app.

3.1.1. Monitor Only

The unit is under control from another device such as a thermostat or local sensor. The CORE LITE Unit Controller will not respond to setpoints or application mode demands related to heating/cooling sent over the network. Use this mode if you only wish to monitor the operation of the RTU.

3.1.2. Room Sensor

In this mode, the rooftop unit is controlled by room temperature setpoints (AO109, AV130 - AV133) and occupancy state (AO104). Room temperature is monitored and compared to the appropriate room temperature setpoints. Room temperature can be provided by local sensor or network value (AO113). Control for Humidity and Ventilation (Co2) is also supported. This is the recommended mode for control via BACnet.

3.2. Backup Sensor Modes

Under certain conditions such as sensor failure, the CORE LITE Unit Controller will go into one of the backup modes of operation as described in the CORE LITE Unit Controller setup guide.

When backup sensor mode is entered, a code 93 will be broadcast over BACnet as well as displayed at the controller display. Backup mode options available are:

- **Return Air Temperature** - Unit will use the pre-configured backup setpoints and the local RAT sensor to heat / cool
- **Thermostat** - Unit will run off a local thermostat. The CORE LITE Unit Controller will require a reset to move back to primary operation in this mode.
- **Room Sensor-** Unit will use local sensors and pre-configured setpoints to run. This mode is only available when Network Thermostat is selected as the Primary Control Mode.
- **None** - Unit will cease to operate until the primary control mode can be restored.

4. Controller Defaults and Time-outs

The CORE LITE Unit Controller does not store commands after a reset. Commands will need to be resent after every reset.

The CORE LITE Unit Controller device must be written to at least every 15 minutes, or it will consider the network to be offline.

The following points (if used) MUST be updated at least every 5 minutes:

- Network Space Temperature (AO113)
- Network Space Humidity
- Network Space CO2
- Network Thermostat Demands (AO101)
- Network Occupancy (AO104)
- Network Setpoints (AO109, AV130-133)

Lennox recommends that the above points (if used) are updated every 2 minutes to ensure a retry is possible within the 5-minute window.

Change of Value (CoV) is supported on the CORE LITE Unit Controller interface.

5. Troubleshooting

Use table 2 as a guide once the BACnet network is set up and operating.

Table 2. BACnet Communication Check (MSTP)

LED	Action
MSTP	
BACnet communication transmit and receive LEDs flash back and forth rapidly.	None. Indicates normal communication.
BACnet communication LEDs are off or intermittently go off for periods of 1 second or longer.	• Check BACnet network connections. • Make sure BACnet network is commissioned. • Make sure each unit has a unique MAC address in the range of 0 to 127. • Verify same baud rate on all devices.
GREEN only	ON BACNET NETWORK NO SEND/RECEIVE = Action - none
YELLOW only	NOT ON NETWORK - 1. Check BACnet network connections.

Control following a connection failure depends on where the failure occurs, and which input device has been used.

Table 3. Device Objects and Property Ranges

Property name	Property Value	Data type	Access
Description	Lennox RTU HVAC Controller	Char String	RW
Object_Identifier*	MAC address	Integer (1-4194302)	RW
Object_Name/Device Object_Name	“Lennox_M4_” + MAC address of MS/TP	Char String (32 char. max.)	RW
Vendor name	Lennox	Char String	R
Model name	“M4”	Char String	RW
Firmware revision	Firmware version dependent	Char String	R
Application software revision	Firmware version dependent	Char String	R
RTU Location	RTU Location	Char String (32 char. max.)	RW
Vendor identifier	255	Integer	R
Max APDU length accepted	Max length is: • 480 for MS/TP	Integer	R
Max Master	127	Integer (1-127)	RW
Segmentation supported	TRUE	Boolean	R
Max Info frames	1	Integer (1-65535)	RW
Serial Number	Factory set	Char String	R
* The default Object_Identifier is the MSTP MAC address which is set locally. To set it to a different value, it must be changed by the front end software.			

NOTE: *The Lennox CORE LITE Unit Controller BACnet interface does not support CoV (Change of Value).*

Table 4. Network Port Object

Property name	Property Value	Data type	Access
Object_Identifier*	0	Integer	R
Object_Name	BACnet/MSTP Network Port	Char String (64 char. max.)	R
Object_Type	56: Object Network Port	Integer	R
Status Flags	Reflect the current status	Bit String	R
Reliability	Reflect the current status	Enumerated	R
Out of Service	Reflect the current status	Boolean	R
Network Type	2: MSTP	Enumerated	R
Protocol Level	2: BACnet Application	Enumerated	R
Network Number	0	Integer	R
Network Number Quality	0	Enumerated	R
Changes Pending	Reflect the current status, if any changes are yet to be effective	Boolean	R
MAC Address	0 - 127 Selectable BACnet MAC address. By default, this value equals the L Connection address.	Octet String	RW
APDU Length	Max length is: • 480 for MS/TP	Integer	R
Link Speed	Reflect the current baud rate	Real Number	R
Link Speeds	List the supported baud rate by the device	Real Number Array	R
Max Master	127	Integer (1-127)	RW
Max Info frames	1	Integer (1-65535)	RW
Description	Lennox RTU MS/TP Network Port	Char String	R
Profile Name	B-ASC Profile	Char String	R
* The default Object_Identifier is the MSTP MAC address which is set locally. To set it to a different value, it must be changed by the front end software.			
R = Read; RW= Read and Write			

6. Object Definitions

6.1. Analog Output

Optional Properties Supported: Min_Pres_Value, Max_Pres_Value

Optional Writable Properties: Out_Of_Service

Analog output object's Overridden status flag set if the equivalent setpoint in the CORE LITE Unit Controller is written to by some S-Bus device.

Table 5. Analog Output (AO) Objects List

Object ID	Object Name	Units	Min. Value	Max. Value	Valid Values within Range	CoV♦	CoV Increment†
101	Application Mode Control*	None	0	255	0, 1,3,6,9,208,209,216,217,218, 219, 220, 221, 222, 254, 255	N/A	N/A
102	Outdoor Air Min Pos Control	Percent	0	255	all	N/A	N/A
104	Occupancy Scheduler Control	None	0	255	all	N/A	N/A
105	BACnet Device Instance	None	1	4194302	all	N/A	N/A
108	Space Dehumidification Setpoint	Percent	0	100	all	N/A	N/A
109	Temperature Setpoint (abs)	Deg. F	36.25	100	all	N/A	N/A
110	Temperature Setpoint Offset	Deg. F	-32	31.75	all	N/A	N/A
111	IAQ 1 Network Input	PPM	300	2000	all	N/A	N/A
112	Humidity Network Input	Percent	0	100	all	N/A	N/A
113	Space Temperature Input	Deg. F	36.25	100	all	N/A	N/A
114	Emergency Override Control	None	0	255	all	N/A	N/A
115	Compressor Enable Control	Percent	0	255	all	N/A	N/A
117	Primary Heat Enable Control	Percent	0	255	all	N/A	N/A
119	Auxiliary Heat Enable Control	Percent	0	255	all	N/A	N/A
127	Supply Fan Capacity Input	Percent	33	255	all*	N/A	N/A
128	Exhaust Fan Capacity Input	Percent	33	255	all	N/A	N/A
129	Set Economizer Outdoor Air Suitable	None	0	255	all	N/A	N/A

* See "Application Details" on page 16 for limitations on data ranges.

♦ CoV - "Available" indicates this functionality is supported for Analog Output Objects. When these objects are subscribed and values are changed, the CORE LITE Unit Controller will issue a notification to the subscriber.

† CoV Increment - "N/A" (not available) indicates this property is not supported for the object.

6.2. Analog Input

Optional Properties Supported: None

Optional Writable Properties: Out_Of_Service (AI239 - AI252, AI274 - AI285 only)

Table 6. Analog Input (AI) Objects List

Object ID	Object Name	Units	Data Range	CoV♦	CoV Increment †
198	Mac Address	None	0 - 127	N/A	N/A
199	IMC Address	None	1-31	N/A	N/A
231	Unit ID	None	0 - 255	N/A	N/A
232	Unit Status	None	0 - 255	Available	Available
239	Space Temperature	Deg. F	63.75 - 100.00	Available	Available
240	Discharge Air Temperature	Deg. F	-8.7 – 164.4	Available	Available
241	Effective Occupancy	None	0 - 2	Available	Available
242	Local Outside Air Temperature	Deg. F	-30.6 – 131.6	Available	Available
243	Local Space Temperature	Deg. F	63.75 – 100.00	Available	Available
244	Outside Air Damper	Percent	0 - 100, 255	Available	Available
245	Heat Primary	Percent	0 – 100	Available	Available
246	Heat Secondary	Percent	0 – 100	Available	Available
247	Cool Primary	Percent	0 – 100	Available	Available
248	Economizer Enabled	None	0, 1, 255	Available	Available
250	Supply Fan Status	Percent	0 - 100	Available	Available
252	Space Temperature Setpoint (Eff)	Deg. F	40.0 – 95.0	Available	Available

♦ CoV - “Available” indicates this functionality is supported for Analog Output Objects. When these objects are subscribed and values are changed, the CORE LITE Unit Controller will issue a notification to the subscriber.

† CoV Increment - “N/A” (not available) indicates this property is not supported for the object.

Table 6. Analog Input (AI) Objects List

Object ID	Object Name	Units	Data Range	CoV♦	CoV Increment †
253	Current Error	These legacy alarm reporting objects are obsolete. These obsolete objects are replaced with the new CSV 302 object, which lists the same alarm list information. All new BACnet installations should use the new CSV 302 object instead of the obsolete legacy objects for retrieving alarming information.			
273	IAQ 2 Effective Value	Volt	0 - 10	Available	Available
274	Space CO2 Sensor (Eff)	Parts-per-million	0 - 2000	Available	Available
275	Space CO2 Sensor (Local)	Parts-per-million	0 - 2000	Available	Available
276	Space Humidity (Eff)	Percent	0 - 100	Available	Available
277	Space Humidity (Local)	Percent	0 - 100	Available	Available
278	Dehumidification Setpoint (Eff)	Percent	0 - 100	Available	Available
279	Dehumidification Status	None	0 - 2	Available	Available
281	Return Air Temperature	Deg. F	-8.7 – 164.4	Available	Available
285	Exhaust Fan Status	Percent	0 - 100	Available	Available

** Multiply the tonnage of the RTU with the value in CFM/ton to derive the value in CFM units.

1.♦ CoV - “Available” indicates this functionality is supported for Analog Input Objects. When these objects are subscribed and values are changed, the CORE LITE Unit Controller will issue a notification to the subscriber.

† CoV Increment - “N/A” (not available) indicates this property is not supported for the object.

6.3. Analog Value

Optional Properties Supported: None

Optional Writable Properties: Present_Value

Table 7. Analog Value (AV) Objects List

Object ID	Object Name	Units	Min. Value	Max. Value	Valid Values within Range	Note	CoV♦	CoV Increment†
1	Baud Rate Setting	None	9600	76800	9600, 19200, 38400, 76800	Only used for BACnet MS/TP configurations.	N/A	N/A
130	Heating Occupied Setpoint	Deg. F	40	95	all	For occupied and unoccupied setpoints considered separately, the heating setpoint must be lower than the cooling setpoint by at least the auto-changeover dead-band value set in CORE LITE Unit Controller P153 (default 3°F).	Available	Available
131	Cooling Occupied Setpoint	Deg. F	40	95	all			
132	Heating Unoccupied Setpoint	Deg. F	40	95	all			
133	Cooling Unoccupied Setpoint	Deg. F	40	95	all			
144	Free Cooling Temperature Sensible Setpoint	Deg. F	40	75	all	Unit must be configured for Dual Sensible Free Cooling.	Available	Available
145	Free Cooling Temperature Offset Setpoint	Deg. F	0	40	all	Unit must be configured for single sensible free cooling.	Available	Available
146	Free Cooling Enthalpy Setpoint	mA	10	19	all	Unit must be configured for single Enthalpy free cooling.	Available	Available
147	Free Cooling Enthalpy Offset Setpoint	mA	1	5	all	Allows Configuration of the Enthalpy Offset for Free Cooling.	Available	Available
148	After Hours Override Delay Setpoint	Minutes	0	480	all	Allows a custom override delay timer.	Available	Available

♦ CoV - “Available” indicates this functionality is supported for Analog Value Objects. When these objects are subscribed and values are changed, the CORE LITE Unit Controller will issue a notification to the subscriber.

† CoV Increment - “N/A” (not available) indicates this property is not supported for the object.

6.4. Character String Values

Optional Properties Supported: None

Optional Writable Properties: Present_Value

Table 8. Character String Values (CSV) Objects List

Object ID	Object Name	Units	Valid Values within Range	CoV♦	CoV Increment†
300	Unit Model String	String	String with unit model number.	N/A	N/A
301	Board Firmware Version	String	String with firmware version. Format of FW Version is XX.YY.ZZZZ.	N/A	N/A
302	Alarm Log	String	All Valid Alarm Values. Display string is a "," (comma) separated alarm codes. Last entry in the list is most recent error and first one is oldest.	Available	N/A
305	Compressor Runtime Hours	String	Provides the unit compressor runtime values for the unit. -1: Not Available (Does not have this compressor) 0 - XXXXXX: Hours the compressor has run.	Available	N/A

♦ CoV - "Available" indicates this functionality is supported for Character String Values Objects. When these objects are subscribed and values are changed, the CORE LITE Unit Controller will issue a notification to the subscriber.

† CoV Increment - "N/A" (not available) indicates this property is not supported for the object.

6.5. Multi-State Values

Optional Properties Supported: None
Optional Writable Properties: Present_Value

Table 9. Multi-State Value (MSV) Objects List

Object ID	Object Name	Units	Valid Values	CoV♦	CoV Increment †
310	Mode of Operation	Multi-state value	1 : wired thermostat 2 : remote thermostat 3 : discharge air control 4 : room sensor operation 5 : unit has gone into backup operation	Available	N/A
311	Remote Handset Connection	Multi-state value	1: No Handset Connected 2: Handset Connected	Available	N/A
312	Unit Status	Multi-state value	1 – HVAC heat 2 – HVAC morning warmup 3 – HVAC cool 5 – HVAC pre-cool 6 – HVAC off 7 – HVAC test 8 – HVAC emergency heat 9 – HVAC fan only 12 – HVAC max heat 14 – HVAC dehumidification 30 – HVAC idle 31 – HVAC fresh air heating 32 – HVAC fresh air cooling 33 – HVAC defrost compressor 1 34 – HVAC defrost compressor 2 35 – HVAC defrost compressor 1 & 2	Available	N/A

♦ CoV - "Available" indicates this functionality is supported for Multi-State Value Objects. When these objects are subscribed and state values are changed, the CORE LITE Unit Controller will issue a notification to the subscriber.

† CoV Increment - "N/A" (not available) indicates this property is not supported for the object.

7. Room Sensor Setpoints

- The CORE LITE Unit Controller typically uses four setpoints and the zone temperature to operate the unit when a zone sensor is installed.
- When using the AO:109 single setpoint input, the CORE LITE Unit Controller will use the zone temperature setpoint and Parameter 152 to determine the heat / cool setpoint in the occupied mode. During the unoccupied mode, the CORE LITE Unit Controller will use the zone temperature setpoint and the difference between Parameter 140 and Parameter 138.
- See “Figure 1. CORE LITE Unit Controller Default Setpoint Example (Room Sensor Installed)” for an example of setpoints when the CORE LITE Unit Controller is operating using parameter default values.
- As an alternative, the individual setpoints AV:130-133 may be used. The CORE LITE Unit Controller uses whatever were the last setpoints received, whether from AO:109-110, or AV:130-133.

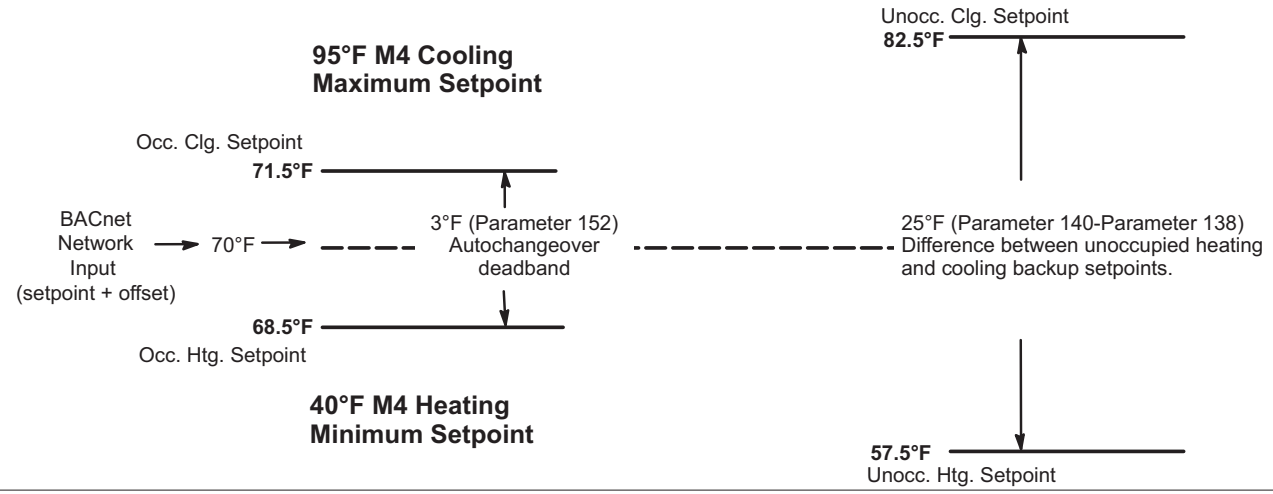

Figure 1. CORE LITE Unit Controller Default Setpoint Example (Room Sensor Installed)

8. Application Details

Object Name: **Application Mode Control**
Object Type: AO (Analog Output)
Object ID: 101
Object Units: (95) No_Units
Value = (See tables below). Set the application mode input to Value.

The CORE LITE Unit Controller can be set locally during commissioning to operate in either of two modes: remote zone sensor control mode (with local or remote zone sensor), or remote thermostat control mode. Several application mode command values are recognized by either room sensor mode, while some can only be used when the CORE LITE Unit Controller is in the remote thermostat control mode.

Table 10. Common Application Mode Values

Value	Mode	Description
0 $00	AUTO	Heating or cooling. Default after reset.
1 $01	HEAT	Heating only.
3 $03	COOL	Cooling only.
6 $06	OFF	Unit off.
9 $09	FAN ONLY	No heating or cooling allowed.
255 $FF	NUL	Same as AUTO.
208 $D0	FAN AUTO	Default after reset. Blower is controlled by CORE as configured in Parameter 154.
209 $D1	FAN ON	Blower On. CORE disregards configuration set in Parameter 154.
216 $D8	EXHAUST AUTO	Power exhaust fan auto. Default after reset.
217 $D9	EXHAUST1 ON	First stage power exhaust fan on.
218 $DA	EXHAUST1 OFF	1st stage power exhaust fan off.
219 $DB	EXHAUST2 ON	2nd stage power exhaust fan on.
220 $DC	EXHAUST2 OFF	2nd stage power exhaust fan off.
221 $DD	EXHAUST ON	Both stages of power exhaust fan on.
222 $DE	EXHAUST OFF	Both stages of power exhaust fan off.
254 $FE	RESET	Force controller reset.

- The four command groups (0-9), (208-209), (216-222), and (224-236, see below) are independent of each other. Selecting a command from one group does not affect any previously sent command from another group. Except for OFF and RESET, which also set FAN AUTO, EXHAUST AUTO, and heat/cool demand IDLE.
- AUTO is the default application mode input. When in a remote zone sensor mode, AUTO allows the CORE LITE Unit Controller to generate heating and cooling demands based on zone temperature and zone temperature setpoint. Auxiliary functions such as dehumidification or emergency override (i.e. smoke mode) will still operate as needed. Also the blower and exhaust fan functions operate.
- HEAT and COOL allow the servicing of only heating or cooling demands. These set a mode only, and do not generate a demand.
- Application mode OFF is a unit-disable state, causing the controller to become idle, and clearing all outputs and timers. All outputs are kept off while application mode is OFF. Since this is a complete unit-disable command, it should not be used to turn off heating and cooling demands as part of remote thermostat operation - use 224 IDLE for that purpose. See below.
- Application mode FAN ONLY disables heating and cooling operation. No effect on fan operation. Return to normal operation with AUTO, HEAT, or COOL.
- Application modes FAN ON and FAN AUTO are used to turn on the main unit fan (blower), or return it to automatic operation.
- Application modes for EXHAUST ON are used to turn on/off a power exhaust fan, or to return it to automatic operation. The CORE LITE Unit Controller may delay up to 30 seconds before responding to an exhaust command. These commands apply to single-, two-, and variable-speed power exhausts. A variable-speed exhaust is enabled here, while the speed is adjusted using AO:128, the Exhaust Fan Capacity Input.
- Application mode RESET causes the system to reset itself and go through the controller start-up and initialization routines. This takes about 8 seconds in an CORE LITE Unit Controller, during which time the analog and digital inputs are settling to correct values. The controller will return to AUTO operation.
- AUTO and EXHAUST AUTO are the defaults after reset.
- Fan mode operation will default to CORE LITE Unit Controller Parameter 154 unless FAN AUTO or FAN ON are written to.

8.1. Object IDs

8.1.1. Analog Outputs (AO)

Table 11. Object ID 101

Object Name:	Application Mode Control
Object Type:	AO (Analog Output)
Object Units:	(95) No_Units
Value:	0, 1,3,6,9,208,209,216,217,218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 232, 233, 234, 236, 254, 255
Details:	See “Application Details” on page 16

Table 12. Object ID 102

Object Name:	Outdoor Air Min Pos Control
Object Type:	AO (Analog Output)
Object Units:	(98) Percent
Value:	0 - 255
Details:	0 -100: Set the minimum position of the outdoor air economizer damper; % open. 101 - 255: Relinquish to local control. Min damper position depends on the setting in CORE Unit Controller Parameter 132: Parameter 132 =101: Min damper position set by Parameter 132. A value written to AO102 will take priority over any locally set damper positions. A minimum damper position, either locally set or set via AO102, is only valid when the unit is occupied and the blower is operating. The damper will be closed if the unit is not occupied and the blower is not operating. The default value after reset is the locally configured value.

Table 13. Object ID 104

Object Name:	Occupancy Scheduler Control
Object Type:	AO (Analog Output)
Object Units:	(95) No_Units
Value:	0 - 255
Details:	0: space occupied 1-255: space unoccupied Default value following reset is determined by Parameter 225. Once a value for AO:104 is received, the Parameter 225 value is ignored.

Table 14. Object ID 105

Object Name:	BACnet Device Instance
Object Type:	AO (Analog Output)
Object Units:	(95) No_Units
Value:	1 - 4194302
Details:	Device ID, it must be unique in the BACnet network. For MS/TP , 2 is the default value.

Table 15. Object ID 108

Object Name:	Space Dehumidification Setpoint
Object Type:	AO (Analog Output)
Object Units:	(99) Percent
Value:	0 - 100
Details:	0 - 100: % relative humidity setpoint Dehumidification begins when the effective space relative humidity rises to this setpoint value. The default following reset is local control. Once an executive controller has sent a setpoint for AO:108, there is no way to return to the local setpoint except by controller reset. Dehumidification ends when the effective space relative humidity falls below this setpoint value minus a dehumidification dead-band that is typically 3%. The dead-band value is set locally during commissioning.

Table 16. Object ID 109

Object Name:	Temperature Setpoint (abs)
Object Type:	AO (Analog Output)
Object Units:	(64) Degrees-Fahrenheit
Value:	36.25 – 100.00°F, in 0.25°F increments
Details:	The single-point temperature setpoint (abs) (including offset; see below) is converted locally to occupied and unoccupied heating and cooling setpoints. The occupied and unoccupied heating and cooling setpoints are computed to be centered (if possible) on the effective single-point setpoint. This is done while preserving the occupied and unoccupied dead-bands, as well as any local restrictions on minimum or maximum values. The default following reset is 70°F, but local values are used for the heating and cooling (occupied and unoccupied) setpoints until a value is received for AO:109. As an alternative method of establishing setpoints, the individual setpoints AV:130-133 may be used. The CORE Unit Controller uses whatever were the last setpoints received, whether from AO:109-110, or AV:130-133. The occupied heat/cool auto-changeover dead-band value is set locally during commissioning. The unoccupied heat/cool auto-changeover dead-band value is set locally during commissioning by adjusting the backup unoccupied heating and cooling setpoints. The difference between these setpoints will be used as the unoccupied heat/cool auto-changeover dead-band value.

Table 17. Object ID 110

Object Name:	Temperature Setpoint Offset
Object Type:	AO (Analog Output)
Object Units:	(64) Degrees-Fahrenheit
Value:	-32.00 – 31.75°F, in 0.25°F increments
Details:	A signed value added to the temperature setpoint (abs) value to provide an effective temperature setpoint. See above regarding dead-bands and limits. The default following reset is 0°F.

Table 18. Object ID 111

Object Name:	IAQ 1 Network Input
Object Type:	AO (Analog Output)
Object Units:	(96) PPM
Value:	300 - 2000
Details:	A network value for the space IAQ 1 (CO_2 Sensor) input. If configured correctly, the CORE LITE Unit Controller will utilize this value as the effective CO_2 value for Demand Control Ventilation. It is recommended that network data be updated at intervals of no more than 2 minutes to be sure that a single missed-data event will not constitute a data update failure. If data appears after a sensor failure is processed, it will be treated as an intermittent sensor. Normal operation will resume.

Table 19. Object ID 112

Object Name:	Humidity Network Input
Object Type:	AO (Analog Output)
Object Units:	(98) Percent
Value:	0 - 100
Details:	A network value for the space humidity input. If configured correctly, the CORE LITE Unit Controller will utilize this value as the effective Humidity value for dehumidification. It is recommended that network data be updated at intervals of no more than 2 minutes to be sure that a single missed-data event will not constitute a data update failure. If data appears after a sensor failure is processed, it will be treated as an intermittent sensor. Normal operation will resume.

Table 20. Object ID 113

Object Name:	Space Temperature Input
Object Type:	AO (Analog Output)
Object Units:	(64) Degrees-Fahrenheit
Value:	36.25 – 100.00°F, in 0.25°F increments
Details:	A network value for the space temperature. Heating and cooling demands are generated based on the space temperature Input, and the Temperature Setpoint (abs) and Temperature Setpoint Offset values. The default following reset is 72.5°F. • When a CORE LITE Unit Controller is commissioned for BACnet® gateway remote room sensor operation, it will wait for 5 minutes following start-up to receive space temperature data. The CORE LITE Unit Controller will remain in a no-run mode until data is received, or until the 5 minute period has expired. • If 5 minutes passes without data being received, then the CORE LITE Unit Controller begins to use local data for the space temperature. If a local sensor is connected then it will be used. If not, then a failed-sensor error is recorded and the CORE LITE Unit Controller will enter the backup mode of operation (set locally during commissioning). • It is recommended that network data be updated at intervals of no more than 2 minutes to be sure that a single missed-data event will not constitute a data update failure. • If data appears after a sensor failure is processed, it will be treated as an intermittent sensor. Normal operation will resume. If the CORE LITE Unit Controller is in a backup mode, then it will reset before resuming.

Table 21. Object ID 114

Object Name:	Emergency Override Control
Object Type:	AO (Analog Output)
Object Units:	(95) No_Units
Value:	0 - 255
Details:	Set the emergency mode defined by value, decoded as:

Value	Mode	Supply Fan	Exhaust Fan	Outdoor Damper
0	NORMAL	auto	auto	auto
1	PRESSURIZE	on	off	open
2	DEPRESSURIZE	off	on (speed)	closed
3	PURGE	on	on (speed)	open
4	SHUTDOWN	off	off	closed
5	FIRE			
6	DEPRESSURIZE	off	on (pressure)	closed
7	PURGE	on	on (pressure)	open
>7	NUL (normal)	auto	auto	auto

- (auto) - normal operation
- (speed) - exhaust fan runs at speed pre-selected at equipment
- (pressure) - exhaust fan runs to maintain building press setpoint; local or remote

Mode 5, FIRE, is a locally defined operation (set at commissioning). For units without VFD exhaust fans, modes 6-7 are the same as 2-3. The default following reset is 0 (NORMAL).

Table 22. Object ID 115

Object Name:	Compressor Enable Control
Object Type:	AO
Object Units:	(98) Percent
Value:	0 - 255
Details:	0: output disabled 1-100: output limited to 1 – 100% of maximum 101-255: maximum output permitted

The following table shows the value where the indicated compressor stage is disabled, for equipment having the indicated maximum number of compressor stages:

Number of Stages on Unit	Stage is Disabled when Value < X			
	Stage 1	**Stage 2**	**Stage 3**	**Stage 4**
1	Value < 50			
2	Value < 33	Value < 66		
3	Value < 25	Value < 50	Value < 75	
4	Value < 20	Value < 40	Value < 60	Value < 80

Free cooling using an economizer with outdoor air is not considered a stage. Only compressors are considered to be stages. All compressors installed are included, however they are being used; sensible cooling, condenser reheat (latent cooling), or heat pump heating. The default following reset is 100%.

Disabled stages are re-enabled at the above values plus 3% hysteresis.

Ultra-High Efficiency 3 - 6 ton units behave as a single stage unit with respect to AO115. A value less than 50 disables compressor operation. A value greater than or equal to 53 enables compressor operation. Compressor speed is determined locally.

For 3 - 6 ton (LGM/LCM) units, values less than 40% will disable the compressor. Values between 40 and 100 will limit the max compressor Hz to the written % of max Hz.

3 - 6 Ton (LGM/LCM) Units	
Value	Compressor
0 - 40%	Disabled
40 - 100%	Max Hz limited to given value

Table 23. Object ID 117

Object Name:	Primary Heat Enable Control
Object Type:	AO (Analog Output)
Object Units:	(98) Percent
Value:	0 - 255
Details:	0: output disabled 1-100: output limited to 1 – 100% of maximum 101-255: maximum output permitted The table shown above for Compressor Enable Control can also be applied here to the Primary Heat Enable Control. It shows the value where the indicated primary heating stage is disabled, for equipment having the indicated maximum number of primary heating stages. The default following reset is 100%.

Table 24. Object ID 119

Object Name:	Auxiliary Heat Enable Control
Object Type:	AO (Analog Output)
Object Units:	(98) Percent
Value:	0 - 255
Details:	0: output disabled 1-100: output limited to 1 – 100% of maximum 101-255: maximum output permitted It shows the value where the indicated auxiliary heating stage is disabled, for equipment having the indicated maximum number of auxiliary heating stages. The default following reset is 100%.

Table 25. Object ID 127

Object Name:	Supply Fan Capacity Input
Object Type:	AO (Analog Output)
Object Units:	(98) Percent
Value:	33 - 255
Details:	33 - 100: Set the supply fan capacity as a % of maximum speed. 101-255: Relinquish to local control. Supply fan capacity depends on CORE LITE Unit Controller parameter values. Supply fan capacity is only effective when the main blower is running. Minimum value is limited by parameter 28 (if heating) or parameter 27 (if cooling/ventilation/smoke). Use of this object is not recommended while the unit is in a discharge control mode of operation (cooling or DACH).

Table 26. Object ID 128

Object Name:	Exhaust Fan Capacity Input
Object Type:	AO (Analog Output)
Object Units:	(98) Percent
Value:	33 - 255
Details:	Exhaust fan capacity is only effective when the exhaust fan is running. Default value following reset is 255 (local).

Table 27. Object ID 129

Object Name:	Set Economizer Outdoor Air Suitable
Object Type:	AO (Analog Output)
Object Units:	(95) No_Units
Value:	0 - 255
Details:	0: Economizer disable 1: Economizer enable >1: Economizer to auto When outdoor air is determined to be suitable for free cooling, the economizer feature will operate (if installed) on a first stage cooling call to use outdoor air instead of mechanical cooling. AO:129 is used to allow an executive controller to set the state of outdoor air suitability (OAS). It can be enabled, disabled, or left for the local controller to determine. BACnet control of the economizer requires the CORE LITE Unit Controller is configured for Economizer temperature Mode. Run the CORE LITE Unit Controller install wizard to verify that Configuration ID 1, position 2 is set to T for Temperature. Default value following reset is 255 (auto).

8.1.2. Analog Inputs (AI)

Table 28. Object ID 198

Object Name:	MAC Address
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	0 - 127
Details:	Selectable BACnet MAC address. By default, this value equals the L Connection address.

Table 29. Object ID 199

Object Name:	IMC Address
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	1 - 31
Details:	Selectable L Connection address (1-31). This address is used for L Connection network.

Table 30. Object ID 231

Object Name:	Unit ID
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	0 - 255
Details:	48-63: gas heat, electric cool 64-79: electric heat, electric cool 80-95: electric heat pump, with or without electric resistive heat

Table 31. Object ID 232

Object Name:	Unit Status
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	0 - 255
Details:	0 – HVAC idle 1 – HVAC heat 2 – HVAC morning warmup 3 – HVAC cool 5 – HVAC pre-cool 6 – HVAC off 7 – HVAC test 8 – HVAC emergency heat 9 – HVAC fan only 12 – HVAC max heat 14 – HVAC dehumidification 129 – HVAC fresh air heating 131 – HVAC fresh air cooling 177 – HVAC defrost compressor 1 & 2 145 – HVAC defrost compressor 1 161 – HVAC defrost compressor 2

Table 32. Object ID 239

Object Name:	Space Temperature
Object Type:	AI (Analog Input)
Object Units:	(64) Degrees-Fahrenheit
Value:	63.75 – 100.00 °F, in 0.25 °F increments
Details:	Space temperature from local CORE LITE Unit Controller sensor, or from Space Temperature Input. This is the actual value being used by the CORE LITE Unit Controller. Its source is either a locally wired temperature sensor (see “Local Space Temperature) or the network input (see Space Temperature Input).

Table 33. Object ID 240

Object Name:	Discharge Air Temperature
Object Type:	AI (Analog Input)
Object Units:	(64) Degrees-Fahrenheit
Value:	-8.7 – 164.4 °F, in 0.7 °F increments
Details:	Discharge air temperature measurement from the local sensor.

Table 34. Object ID 241

Object Name:	Effective Occupancy
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	0 - 2
Details:	0: space occupied 1: space unoccupied 2: space occupied (timed override) The occupancy override timer is established locally for each controller during system commissioning. The Effective Occupancy depends on the Occupancy Scheduler Control, the Occupancy Override Control, and the “Occupancy Sensor Input. The local CORE LITE Unit Controller occupied input is ignored when a BACnet® interface is used.

Table 35. Object ID 242

Object Name:	Local Outside Air Temperature
Object Type:	AI (Analog Input)
Object Units:	(64) Degrees-Fahrenheit
Value:	-30.6 – 131.6 °F, in 0.6 °F increments
Details:	Outdoor air temperature measurement from the local sensor.

Table 36. Object ID 243

Object Name:	Local Space Temperature
Object Type:	AI (Analog Input)
Object Units:	(64) Degrees-Fahrenheit
Value:	63.75 – 100.00 °F, in 0.25 °F increments
Details:	Space temperature from the local temperature sensor.

Table 37. Object ID 244

Object Name:	Outside Air Damper
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 – 100, 255
Details:	0 - 100: Outdoor air damper position. Percent-open. 255: No damper. This is a measure of the feedback voltage from the damper motor. The 2-10V feedback signal is converted to 0-100% open damper position provided by AI:244. There is frequently some offset between the indicated damper position given by AI:244 and the physical damper position.

Table 38. Object ID 245

Object Name:	Heat Primary
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 – 100
Details	0 - 100: Current level of the primary heating capacity. This is based on the number of gas stages operating in a gas/electric unit, or compressors operating in a heat pump, or electric resistance stages operating in an electric/electric unit.

Table 39. Object ID 246

Object Name:	Heat Secondary
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 – 100
Details:	0 - 100: Current level of the secondary heating capacity. This is auxiliary (electric resistance “strip”) heat in a heat pump. Whether it is on in addition to the primary heat (compressor), or as emergency heat while the compressor is locked-out.

Table 40. Object ID 247

Object Name:	Cool Primary
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 – 100
Details:	0 - 100: Current level of the primary cooling capacity. This is based on the number of compressors operating. There is no secondary cooling.

Table 41. Object ID 248

Object Name:	Economizer Enabled
Object Type:	AI (Analog Input)
Object Units:	(95) No_Unit
Value:	0 – 1, 255
Details:	0: Economizer is disabled. 1: Economizer is enabled (outdoor air is suitable for free cooling). 255: No economizer. The enabled state only indicates that the CORE Unit Controller has determined that the outdoor air is suitable for free cooling. The unit is actually executing free cooling operation if “Economizer Enabled” is 1, and “Unit Status” is 3, 5, or 131.

Table 42. Object ID 250

Object Name:	Supply Fan Status
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 – 100
Details:	0: Supply fan off. 1: Supply fan on (single-speed fan). 2 - 100: Supply fan on (variable-speed fan; percent of full speed).

Table 43. Object ID 252

Object Name:	Space Temperature Setpoint (Eff)
Object Type:	AI (Analog Input)
Object Units:	(64) Degrees-Fahrenheit
Value:	40.0 – 95.0°F, in 0.25°F increments
Details:	The effective space temperature setpoint, which depends on: • Current “Temperature Setpoint (abs)” • Current “Temperature Setpoint Offset” • Current “Effective Occupancy” • Most recent heating or cooling demand indicated by “Unit Status” • Any local setpoint adjustment • Heating and cooling deadbands and differentials set at system commissioning Most recent heating or cooling demand indicated by “Unit Status”, any local setpoint adjustment, and heating and cooling dead-bands and differentials set at system commissioning.

Table 44. Object ID 253

Object Name:	Current Error
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	0 - 1024 0: If no alarm is active.
Details:	***NOTE: Use CSV 302 for all new installations.*** • This is the code for the currently occurring alarm condition, if any. If no alarm is currently in progress, then the value is 0. If the value is not zero, then “Current Error” and “Most Recent Error 1” will be equal. Refer to the CORE LITE Unit Controller Setup Guide for alarm code descriptions. • CoV and CoV increment is available for this object.

Table 45. Object ID 273

Object Name:	IAQ 2 Effective Value
Object Type:	AI (Analog Input)
Object Units:	(5) Volts
Value:	0 - 10
Details:	This is the actual value being used by the CORE LITE Unit Controller and is the value measured at the CORE LITE Unit Controller..

Table 46. Object ID 274

Object Name:	Space CO2 Sensor (Eff)
Object Type:	AI (Analog Input)
Object Units:	(96) Parts-per-million
Value:	0 - 2000
Details:	0 - 6: no sensor 7 - 1992: valid CO_2 measurement 1993 - 2000: sensor error This is the effective CO_2 (IAQ1) measurement being used by the CORE LITE Unit Controller based on it's configuration. See AI275 and AO111 for the sources of this measurement.

Table 47. Object ID 275

Object Name:	Space CO2 Sensor (Local)
Object Type:	AI (Analog Input)
Object Units:	(96) Parts-per-million
Value:	0 - 2000
Details:	0 - 6: no sensor 7 - 1992: valid CO_2 measurement 1993 - 2000: sensor error This is the current value of the local sensor (if attached) to the CORE LITE Unit Controller's SmartWire terminals.

Table 48. Object ID 276

Object Name:	Space Humidity (Eff)
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 - 100
Details:	0: no sensor 1 - 99: valid relative humidity measurement 100: sensor error This is the effective humidity measurement being used by the CORE LITE Unit Controller based on it's configuration. See AI277 and AO112 for the sources of this measurement.

Table 49. Object ID 277

Object Name:	Space Humidity (Local)
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 - 100
Details:	0: no sensor 1 - 99: valid relative humidity measurement 100: sensor error This is the current value of the local sensor (if attached) to the CORE LITE Unit Controller's SmartWire terminals.

Table 50. Object ID 278

Object Name:	Dehumidification Setpoint (Eff)
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 - 100
Details:	Relative humidity setpoint for dehumidification operation. Deadband is set locally during commissioning.

Table 51. Object ID 279

Object Name:	Dehumidification Status
Object Type:	AI (Analog Input)
Object Units:	(95) No_Units
Value:	0 - 2
Details:	0: No dehumidification installed. 1: Dehumidification installed but not running. 2: Dehumidification installed and running.

Table 52. Object ID 281

Object Name:	Return Air Temperature
Object Type:	AI (Analog Input)
Object Units:	(64) Degrees-Fahrenheit
Value:	-8.7 – 164.4°F, in 0.7°F increments
Details:	Unit return air temperature measurement from an attached CORE LITE Unit Controller sensor.

Table 53. Object ID 285

Object Name:	Exhaust Fan Status
Object Type:	AI (Analog Input)
Object Units:	(98) Percent
Value:	0 - 100
Details:	0: Exhaust fan off. 1: Exhaust stage 1 on. 2: Exhaust stage 2 on. 33-100: Exhaust variable speed % on. 255: No exhaust.

8.1.3. Analog Values (AV)

Table 54. Object ID 1

Object Name:	Baud Rate Setting
Object Type:	AV (Analog Value)
Object Units:	(95) No Units
Value:	9600, 19200, 38400, 76800
Details:	Baud rate change only takes affect after the CORE LITE Unit Controller resets. Only applicable when setup for MS/TP operation. Default value following reset is 38400, but this can be changed at the unit. See the CORE LITE Unit Controller setup guide for details.

Table 55. Object ID 130

Object Name:	Heating Occupied Setpoint
Object Type:	AV (Analog Value)
Object Units:	(64) Degrees-Fahrenheit
Value:	40 - 95
Details:	Occupied heating setpoint. Default value following reset is local. As an alternative method of establishing setpoints, the single setpoint AO:109 and offset AO:110 may be used. The CORE LITE Unit Controller uses whatever were the last setpoints received, whether from AO:109-110, or AV:130-133. To be considered in range the values for AV:130, 131, 132, and 133 must be in the range 40-95, and the heating setpoint must be less than the corresponding (occupied or unoccupied) cooling setpoint by at least the auto-changeover dead-band value set in the CORE LITE Unit Controller Parameter 152 (default 3°F, 2-10°F range). If any of these condition is are violated, BACnet will return an out of range message. The AVs 130-133 can be used instead of the single setpoint and offset AO:109 and AO:110.

Table 56. Object ID 131

Object Name:	Cooling Occupied Setpoint
Object Type:	AV (Analog Value)
Object Units:	(64) Degrees-Fahrenheit
Value:	40 - 95
Details:	Occupied cooling setpoint. Default value following reset is local. See description for AV:130 for details on valid range.

Table 57. Object ID 132

Object Name:	Heating Unoccupied Setpoint
Object Type:	AV (Analog Value)
Object Units:	(64) Degrees-Fahrenheit
Value:	40 - 95
Details:	Unoccupied heating setpoint. Default value following reset is local. See description for AV:130 for details on valid range.

Table 58. Object ID 133

Object Name:	Cooling Unoccupied Setpoint
Object Type:	AV (Analog Value)
Object Units:	(64) Degrees-Fahrenheit
Value:	40 - 95
Details:	Unoccupied cooling setpoint. Default value following reset is local. See description for AV:130 for details on valid range.

Table 59. Object ID 142

Object Name:	IAQ Setpoint Start Open
Object Type:	AV (Analog Value)
Object Units:	(96) PPM
Value:	0 - 2000
Details:	IAQ Setpoint for start open behavior for DCV Operation.

Table 60. Object ID 143

Object Name:	IAQ Setpoint Full Open
Object Type:	AV (Analog Value)
Object Units:	(96) PPM
Value:	0 - 2000
Details:	IAQ Setpoint for full open behavior.

Table 61. Object ID 144

Object Name:	Free Cooling Temperature Sensible Setpoint
Object Type:	AV (Analog Value)
Object Units:	(64) Degrees-Fahrenheit
Value:	40 - 75
Details:	Economizer free cooling setpoint for temperature sensible setpoint operation.

Table 62. Object ID 146

Object Name:	Free Cooling Enthalpy Setpoint
Object Type:	AV (Analog Value)
Object Units:	(2) mA
Value:	10 - 19
Details:	Economizer free cooling setpoint for single enthalpy operation.

Table 63. Object ID 147

Object Name:	Free Cooling Enthalpy Offset Setpoint
Object Type:	AV (Analog Value)
Object Units:	(2) mA
Value:	1 - 5
Details:	Economizer free cooling setpoint for dual enthalpy operation.

Table 64. Object ID 148

Object Name:	After Hours Override Delay Set
Object Type:	AV (Analog Value)
Object Units:	(72) Minutes
Value:	0 - 480
Details:	After hours delay setpoint. Used in override conditions.

Appendix A — Blower Operations and Effective Occupancy

This section describes how BACnet® occupancy signals are combined to produce effective occupancy.

The blower runs to service heat and cool demands, regardless of the space occupancy. However when there is no heating or cooling demand there are options for how the blower should operate in conjunction with occupancy signals to keep the space ventilated, or the air stirred.

1. **California Energy Commission Title 24 -** The legacy option settings for **OCC Blower Mode** are **AUTO CYCLES** or **ON-CONTINUOUS 1**. These settings govern whether the blower runs continuously when the space is considered occupied, or cycles on/off with the heating and cooling demand. To comply with the California Energy Commission Title 24 standard there are two additional values for **OCC Blower Mode** which are **ON-CONTINUOUS 2** and **ON-CONTINUOUS 3**.

Table 65. Blower Operation Description

OCC Blower Mode	Description
AUTO CYCLES	Blower cycles on/off with demand. (Legacy usage.)
ON-CONTINUOUS 1	Blower runs when either the occupancy sensor or schedule, or both, indicates occupied. (Legacy usage.)
ON-CONTINUOUS 2	Blower runs when both the occupancy sensor and schedule indicate occupied.
ON-CONTINUOUS 3	The same as option 2, but blower runs for 30 minutes and is off for 90 minutes when schedule is occupied but the occupancy sensor is not occupied.

2. Menu Setup Procedure Method for OCC Blower Mode

   These blower control options are handled by the OCC Blower Mode. These settings can be changed using the following menu path:
   Go to **RTU MENU > NETWORK INTEGRATION > NETWORK SETUP WIZARD > CONTROL MODE = ROOM SENSOR >(**additional prompts concerning network configuration and sensor types will be asked**) CONTROL MODE = ROOM SENSOR > ROOM SENSOR OCC BLOWER MODE** = (see “Table 6. Analog Input (AI) Objects List” on page 10)

NOTE: *Refer to **CORE LITE Service App Menu Selection Overview, Install Menu Structure,** and **BACnet MS/TP Menu Structure** in the Lennox® CORE LITE Control System (Unit Controller) Application Guide for further guidance.*

Table 66. BACnet Occupancy Points

Mode	BACnet	Value
Schedule	Occupancy Scheduler Control AO 104	0: space occupied
		1255: space unoccupied
Effective Occupancy	Effective Occupancy AI 241	0: space occupied
		1: space unoccupied
		2: space occupied (timed override)

Table 67. Blower Operation Description

Blower Operation	Description
On	Blower runs continuously.
Cycles	Blower cycles on/off with demand.
Cycles w/Stir	Blower cycles on/off with demand; during off cycle blower is on 30 minutes of 120.

Table 68. Blower Operation Schedule

Manual	Schedule	Sensor	Effective Occupancy	OCC BLOWER MODE	Blower Operation
0, 2	n/a	n/a	OCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	On
				ON-CONTINUOUS 2	On
				ON-CONTINUOUS 3	On
1	n/a	n/a	UNOCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	Cycles
				ON-CONTINUOUS 2	Cycles
				ON-CONTINUOUS 3	Cycles
3255	0	0, 2-225	OCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	On
				ON-CONTINUOUS 2	On
				ON-CONTINUOUS 3	On
3255	0	1	OCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	On
				ON-CONTINUOUS 2	Cycles
				ON-CONTINUOUS 3	Cycles w/Stir
3255	1255	n/a	UNOCCUPIED	AUTO-CYCLES	Cycles
				ON-CONTINUOUS 1	Cycles
				ON-CONTINUOUS 2	Cycles
				ON-CONTINUOUS 3	Cycles